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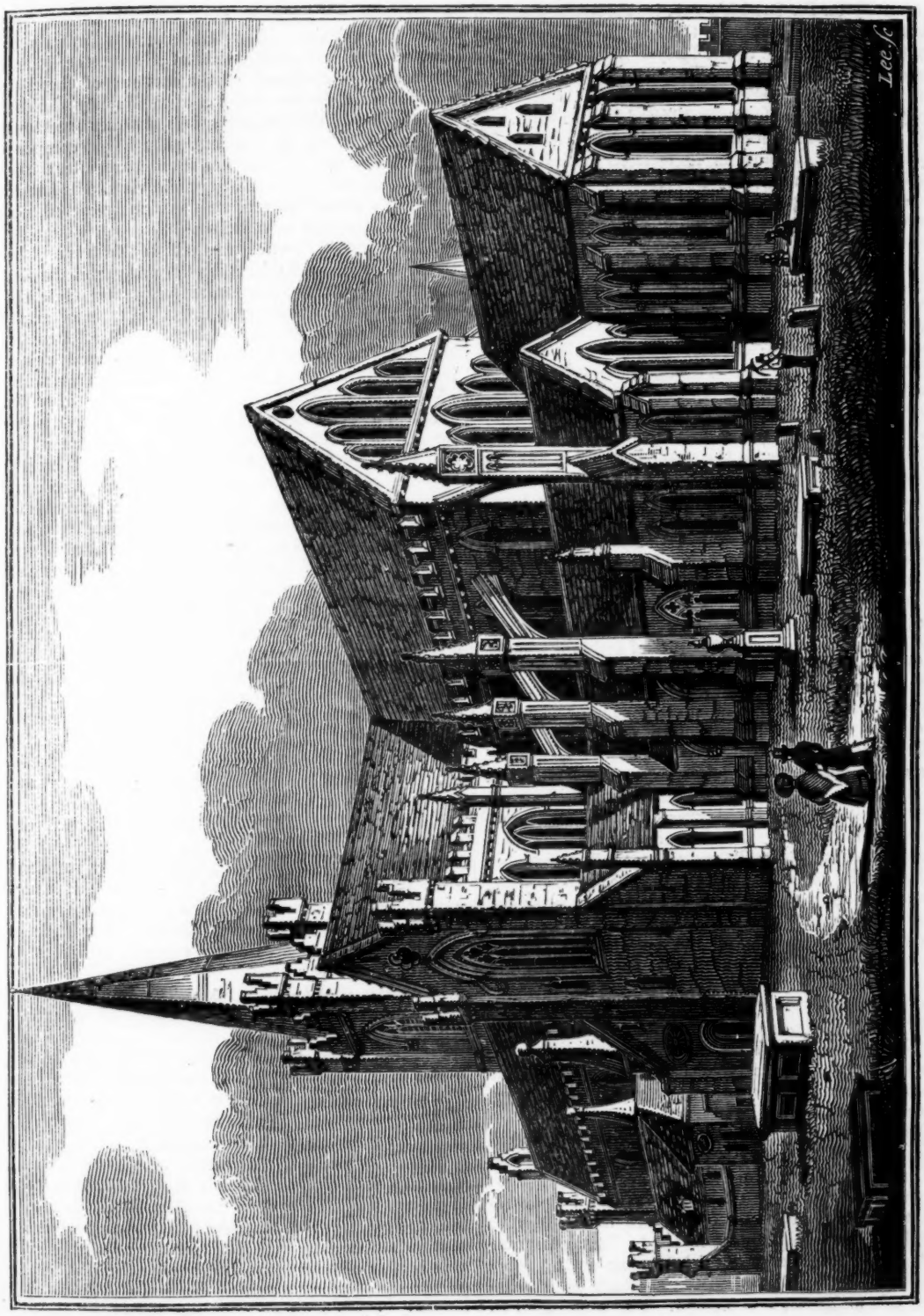
UNDER THE DIRECTION OF THE COMMITTEE OF GENERAL LITERATURE AND EDUCATION, APPOINTED BY THE SOCIETY FOR PROMOTING CHRISTIAN KNOWLEDGE



THE CATHEDRAL CHURCH OF SAINT PATRICK, DUBLIN.

THE CATHEDRAL OF SAINT PATRICK, DUBLIN.

SAINT PATRICK'S CATHEDRAL was erected by John Comyn, the first English Archbishop of Dublin, in the year 1191, on the site, as is supposed, of the original church, founded by the Saint himself, who is also said to have baptized his first converts at a well, which Primate Usher states to have been near the present site of the steeple. This ancient church was demolished to make room for a more sumptuous edifice, which was consecrated with great pomp and ceremony on St. Patrick's day, by the Archbishops of Armagh and Dublin, with the Legate O'Heany, who met at the cathedral of the Holy Trinity, whence they made a solemn procession to the newly-built church, in the south suburbs of the city of Dublin, which they dedicated to God, our Blessed Lady Mary, and St. Patrick. The archbishop endowed it as a collegiate church, placing in it thirteen prebendaries; and his successor, Henry de Londres, erected it into a Cathedral, constituting William Fitzguy the first dean, and ordaining that the future deans should be chosen by the chapter from their own body, which consists of five dignitaries and twenty prebendaries. This power of the chapter in electing their dean still continues; and, by subsequent grants and charters, the dean is possessed of extensive privileges, and exercises the power of an ordinary within the precincts of his cathedral. There are, also, four minor canons, twelve vicars choral, and six choristers. The deanery also enjoyed the privilege of being a sanctuary, as appears upon a roll, 34th of Edward I.

Before the civil wars this cathedral was a building of considerable extent and splendour; the close was separated from the rest of the city suburbs by an ample wall, which contained within its circuit the archiepiscopal palace, the manses of the dean, dignitaries, and prebendaries, and the halls and dormitories of the minor canons and vicars choral. Sir James Ware has declared the church to be, for extent of compass, beauty, and magnificence of structure, preferable to all the other cathedrals of Ireland.

The form of the building is that of a cross, with side aisles; the intersections of the transepts are included in the choir, the eastern window of which is composed of five distinct lancet arches, and forms a fine specimen of the earliest style of pointed arches; the side-windows, eight in number, are similar. Below is a second or lower range of niches, richly ornamented with pilasters and trefoil heads, but impervious to the light; both ranges are perforated transversely through the wall, and form the triforium, or Friars'-walk, round the walls of the choir, and passing thence through the walls of the transepts and nave, they thus encircle the entire cathedral. The great beauty of this portion of the building consists in every thing being uniform; the handsome groined ceiling and clerestory windows above, the banners and insignia of the Knights of St. Patrick, together with their stalls, enriched with handsome Gothic carving, the splendid organ at one end, with the lancet-windows and altar-piece, which represents a glory under a half-drawn curtain at the other, produce a fine effect.

The lofty monument erected by Richard Boyle, first Earl of Cork, stands on the south side of the altar. This monument was originally placed where the Communion-table now stands, but its removal was effected by the influence of the Earl of Strafford, the Lord Deputy, in 1634. It is a singular fact, that the active part which he took in this affair caused many of the misfortunes which afterwards befel this unfortunate nobleman. The monument to the memory of Roger Jones, Viscount Ranelagh, and his brother, Thomas Jones, Archbishop of Dublin, stands on the north side of the altar; it is not so lofty as the Cork monument, but the style of architecture is the same. There are also, round the altar, ancient monuments to the memory of Deans Fyche and Sutton, Sir Anthony St. Leger, Sir Henry Wallop, and Sir Edward Fitton, and a splendid modern one, to the memory of Lady Viscountess Doneraile, who died in 1761.

The south transept, or St. Paul's Chapel, exhibits a mixture of circular and pointed arches, very beautiful in design. This transept was formerly the chapter-house, until the visit of George the Fourth, when the Lady Chapel, at the east end of the choir, was prepared for the occasion of his Majesty's holding the chapter of the knights; it is now restored to its original state, and the ancient altar-steps, composed of enamelled tiles, four inches square, are, after a lapse of some centuries, opened to public view. The ancient chest of the Sacristan, of oak, curiously carved, now occupies the place of the altar.

In 1512, a conference was held in this transept between the Earl of Kildare, Lord Deputy, and the Earl of Ormond, for the purpose of adjusting their disputes. Ormond was attended by a train of armed followers, and the citizens escorted the Lord Deputy; but, during the treaty, a quarrel occurred among their attendants, and the Dublinians let fly a volley of arrows against their opponents, some of which stuck in the images in the rood-loft, without doing further mischief; a profanation, in atonement for which the mayor of Dublin was ordered by the Pope to walk barefoot through the city, in open procession, on *Corpus Christi* day annually, a custom which was observed until the time of the Reformation. It is said that the Earl of Ormond and his followers took possession of the chapter-house, when a treaty took place between the chieftains, and a hole was cut in the door, that they might shake hands before it was opened; the door is still preserved, and shows a perforation of about twelve inches by four. The turbulent chieftains separated with formal declarations of respect and friendship, but with increased animosity on both sides. In this transept are two monuments by Kirk, one to Dr. Sprag, and the other erected by the Friendly Brothers of St. Patrick to the memory of John Ball, Esq., Master in Chancery, and Grand President of the Order.

The north transept, or St. Nicholas' Chapel, was originally the parish-church of the parish of St. Nicholas Without the Walls; but, for forty years and upwards, it had remained a pile of ruins; it is now rebuilt, and the parishioners of St. Nicholas Without again use it as their parish church. The style of architecture is equal to the original in point of execution.

The nave consists of a centre and two side aisles, divided from each other by a range of octagonal pillars, and eight pointed arches; both piers and arches, eight also in number on each side, are of the lancet form, and partake of the plainness and simplicity of the surrounding parts. The western window, forty feet high, is elegant, and, to appearance, rises higher than the original ceiling, and is composed of five compartments, with mullions and transoms with cinquefoil heads, but, being in a state of decay, the present dean, the Rev. Henry B. Dawson, has commenced the rebuilding of this splendid window at his own expense. In the adjoining side aisle is a smaller window, of superior beauty, composed of flowing tracery, curiously arched and foliated. These windows appear to have been erected

by Archbishop Minot in 1370, at which time he built the present steeple, at the north-west angle of the cathedral; the height of the tower is 120 feet, exclusive of the spire, which measures 101 feet more. In the steeple there is a chime of eight bells The monuments in the nave are numerous; those of Dean Swift and Stella attract the notice of the stranger; there is also an ancient sculptured stone to the memory of Michael Tregury, Archbishop of Dublin, 1471; also modern monuments to Primate Marsh, Archbishop Smyth, Earl of Cavan, Serjeant Ball, &c.

St. Mary's, or the Lady Chapel, at the east end of the choir, to which there was a communication where the altar now stands, was built, in 1271, by Archbishop Sandford. In its original state, this chapel must have been splendid; there were lateral aisles within itself, and the walls and clustered pillars appear to have been gilt; it is lighted by five lancet-windows to the east, and eleven similar windows on each side. In 1666, the dean and chapter, with the consent of the Archbishop of Dublin, granted this chapel to the French Protestant refugees, at one shilling per annum, and on Sunday, May 29, the same year, it was opened with great pomp. The Earl of Ormond, then Lord-Lieutenant, proceeded in state from the castle, attended by the Archbishops of Armagh and Dublin, the Lord Chancellor, and Privy Council, and several great lords and other persons of quality, with the Lord-Mayor and Sheriffs; the Countess of Ormond, attended by a train of ladies of quality, also attended. Monsieur Hierosme, her grace's chaplain, read the service of the Church of Ireland in French, after which he preached, and the Archbishop of Dublin gave the benediction in French. In 1816, the remaining descendants of the refugees surrendered this chapel to the dean and chapter, who now use it as their chapter-house.

The dimensions of the cathedral, from the west or St. Patrick's gate, to the east wall of the Lady Chapel, or Chapter-house, is 300 feet; the breadth of the cross, from St. Paul's to St. Nicholas' gate, 157 feet; the breadth of the nave, 67 feet.

It is impossible to think, and not sometimes to think on death. Hope, indeed, has many delusions; whatever is possible, however unlikely, it will teach us to promise ourselves; but death no man has escaped, and therefore no man can hope to escape it.—Johnson.

The homeliest services that we do in an honest calling, though it be but to plough, or dig, if done in obedience, and conscious of God's commandment, is crowned with an ample reward; whereas the best works for their kind, if without respect of God's injunction and glory, are loaded with curses.—Bishop Hall.

THE ACORN.

See from an acorn how the oak is spread,
Uplifting to the skies its towering head,
Matured by time it leaves the verdant plain,
And big with vengeance ploughs the azure main;
Here all our safety, all our wealth arise,
Thus Britons' bulwark in an acorn lies.

The music of the harp may be better spared in a commonwealth, than the noise of a hammer. Indeed, I have heard, that there is a house on London-Bridge built entirely of wood, without any mixture of iron-nails therein, therefore commonly called None-such, for the rarity of the structure thereof: but if any could show a civilized state extant on earth, without the use of smiths therein, it deserveth the name of None-such indeed.—Fuller.

The poorest circumstanees in life, with a religious spirit of resignation, and an honest and upright heart, are far better than the greatest abundance and highest honours without them; for these cannot give that peace of mind, which the other can never want.—Townson.

THE HISTORY AND MANUFACTURE OF GLASS.

The invention, or rather the discovery, of Glass, is said to have been accidental. The account given of this occurrence by Pliny, the Roman naturalist, is, that a merchant vessel, laden with saltpetre, having been driven on shore on the coast of Palestine, near the river Belus, the crew placed the kettles in which they had cooked their victuals on some lumps of their cargo, which, being melted by the action of the fire, combined with the sand on the beach, and formed a kind of glass.

Whether this account be true or not, it is certain, from the specimens which have been discovered in the Egyptian tombs, and other buildings of remote antiquity, that this useful article was known in very ancient times; but it was in these early days more like what we call enamel, being perfectly opaque, and varying much in colour.

The art of rendering glass transparent was not discovered till several centuries later. To whom we are indebted for this valuable discovery is uncertain; but we find it is recorded in history, that Nero, the despotic Roman emperor, paid a sum of money, nearly equal to £50,000 sterling, for "two small cups of transparent glass'

At the beginning of the Christian era, the art of glass-making appears to have made considerable progress, and, at the end of the third century, we find a notice of its being used, in some cases, for the purpose of glazing windows. The invention advanced rapidly in Italy, and afterwards in France; but the first account we have of the use of window-glass in England is in the year 674, when the Abbot Benedict Biscop sent over for foreign artists to glaze the windows of the church and monastery of Wearmouth, in Durham; yet, although thus early known, it was not employed for this purpose in private houses, or even in churches and cathedrals, in this country, till the end of the tenth century.

In the beginning of the fourteenth century, the art of glass-making was introduced into France, on a large scale, and its manufacture was looked upon in so favourable a light by the government, that none but gentlemen, and the sons of the nobility, were allowed to establish a glass-house, or even to assist in the manufacture. This feeling of the gentility of the art of glass-making was not extinct in France when the large French *Encyclopedia* was published, at the end of the seventeenth century, for, in speaking of those employed in it, the word *gentilhomme* (gentleman,) is invariably applied in place of *ouvrier* (workman,) used on other occasions; even in England, some few years since, the workmen were commonly called "the gentlemen glass-blowers."

Formerly every description of flat glass had been *blown*, in the manner we shall presently explain; but in 1688, a very great improvement was made by one Abraham Thevenart, who resorted to the plan of *casting* plates of glass for looking-glasses and other purposes. A large manufactory was established at St. Gobin, in the department of the Aisne, in France, which is still deemed one of the most considerable in Europe

In England, this useful article seems to have been made on a very small scale, until the beginning of the seventeenth century, when the manufacture began to be more considerable. In 1670, workmen were brought from Venice, and many glass-houses were established. In 1771, the British Plate-Glass Company was chartered by Act of Parliament, and an extensive factory was erected at Ravenhead, near St. Helen's, in Lancashire; the works cover about twenty

acres of ground, and nearly three hundred persons are constantly employed.

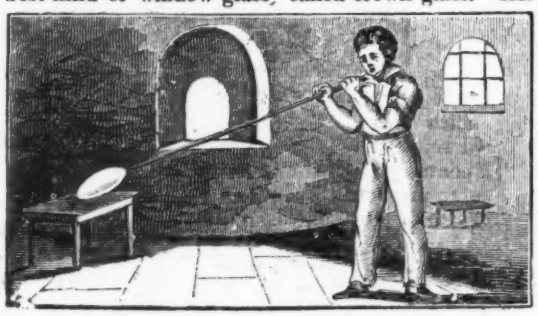
Glass consists essentially of *silex*, the substance of which flint is formed, and some of the various kinds of *alkali*, as *pearlash*, *potash*, *kelp*, &c. The use of the alkali is to cause the flint to melt when in the furnace. The best form in which flint is met with for the purpose of making glass, is in the state of sea-sand; and those kinds best adapted to the purpose in England are procured from Lynn in Norfolk, and from the Isle of Wight.

The first process consists in what is called *fritting*, that is, placing the materials in a crucible, and submitting them to the action of a violent heat, for the purpose of driving off any moisture they may contain, and to prevent their swelling too much when placed in the melting-pots, which are formed of a kind of clay that is able to endure the action of fire without melting. When the materials are sufficiently *fritted*, they are thrown into these pots with clean iron shovels, the fire being previously raised to its greatest intensity, to prevent the whole furnace from being chilled, and to save time. As the fritted materials are much more bulky than when they fall into a thin flowing glass, the pots receive their full charge by two or three successive portions, the last added being always thoroughly melted down before a fresh charge is thrown in. When full, the opening in the pot is closed up with wet clay, except a small hole for examining the work, and when the glass is well refined, and about to be worked off, this opening is again enlarged by the removal of the clay.

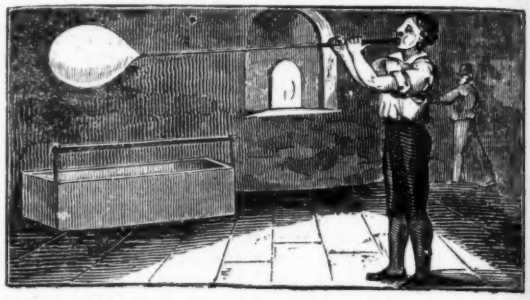
The crucibles, or pots, in which the glass is melted, are of an upright form, with the opening on the side, near to the top; they are arranged in a circle, and built into a conical furnace, the walls of which are in the form of a sugar-loaf.

The kinds of glass manufactured are of various qualities, the commonest being that of which wine-bottles are made; and as this description of goods pays but a small duty in comparison to the finer kinds, the makers are restricted to the use of the coarsest materials, in order that the use of their ware may be confined to common purposes. Window and plate glass are both considerably harder in texture and more brittle than that which is called flint-glass, of which wine-glasses and decanters, lamp-glasses, &c., are made.

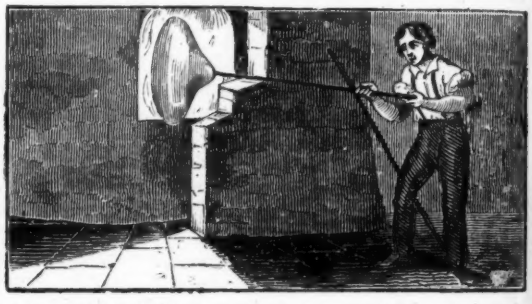
When the materials have been submitted to the action of the fire for a certain time, varying from thirty to thirty-six hours, they have become perfectly liquid; the fire is then damped, and the glass, in this fluid state, is suffered to cool to such an extent, as to become sufficiently thick to be taken up on the end of an iron rod. When in this state there is perhaps no substance in nature so ductile, or so easily moulded into any form that may be required. This wonderful property of glass cannot, perhaps, be exhibited to greater advantage than when the workman avails himself of it in the manufacture of the best kind of window-glass, called crown-glass. His



mode of proceeding is, in the first place, to dip a long iron tube, called Pantin, the end of which has been previously heated, into the melting-pot, and take out as much glass as will adhere to it; this operation he repeats until his judgment tells him he has sufficient metal on the end of the tube to form the table of glass he is about to blow. He then moulds the metal into a regular form, by rolling it on a smooth iron table; when this is accomplished, he blows through the tube, and forms the glass into a hollow vessel, shaped like a pear. He continues to

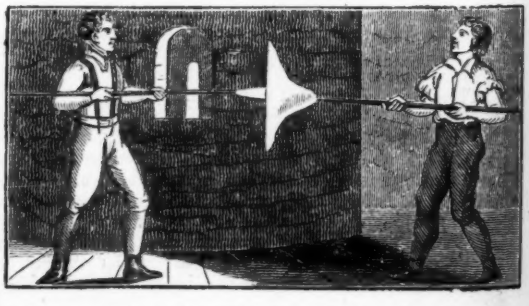


enlarge this form by alternately heating the glass, and blowing through the tube; at the same time, lengthening the neck by rolling it on an iron rod, which may be seen in the engraving, fixed to a kind of seat. It is now carried to the mouth of a larger furnace, called the *bottoming-hole*, in front of which



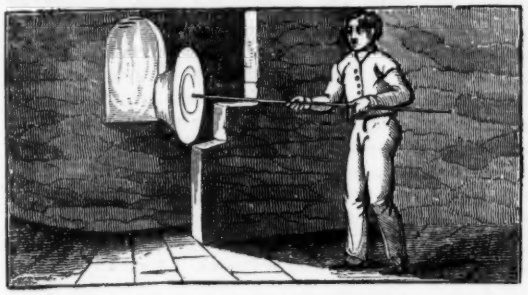
a low wall is built to protect the workmen from the heat; it is here again heated, and whirled round with a slow and steady motion. The effect of this is to flatten the wide end of the glass, owing to the tendency of the metal to fly from the centre on which it revolves, in the same manner as the water does from a wet mop when twirled on the wrist.

A second workman now comes to the assistance of the first, and having taken up a portion of metal on the end of an iron rod, smaller and lighter than that first used, he applies it to the centre of the flat bottom of the glass held by the other, to which it

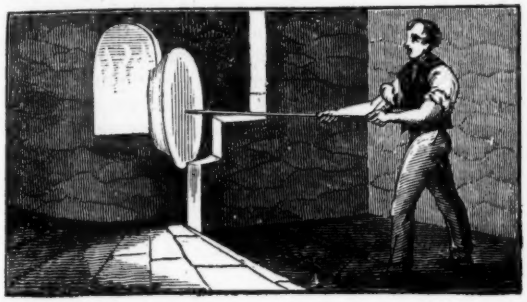


adheres. The first workman now touches the glass, where it is attached to his blowing-tube, with a cold iron rod, which has been dipped in water; this causes the glass to crack, and the blow-pipe is easily detached. Taking hold now of the smaller rod, he

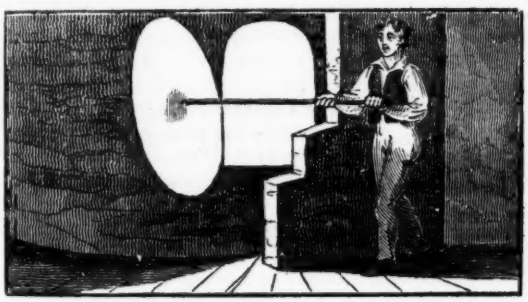
presents the broken end of the glass to the heat of the furnace, and continues the whirling motion; the



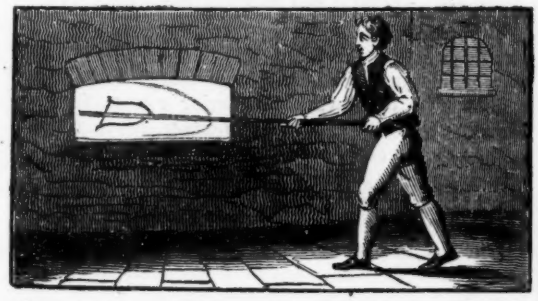
effect of this is to enlarge the opening or mouth of the vessel, as may be seen in the following cut. As



the work proceeds, the workman impels the glass round with greater rapidity, till at length the blazing metal flies out with a jerk with great force, and with a loud ruffling noise, like the rapid unfurling of a flag in a strong breeze. This part of the process is called *flashing* the glass. The sudden extension of

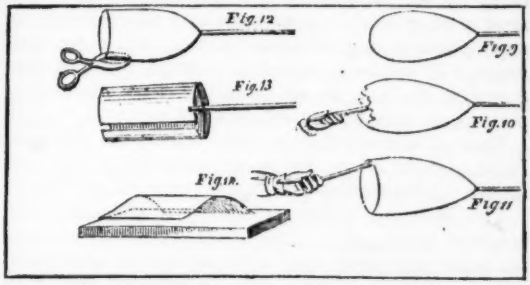


the glass in this part of the process, is sure to strike the spectator, who sees it for the first time, with surprise, and induces him to expect that the glowing mass will be torn to pieces by the violence of the shock. It is now moved more slowly round, till it is sufficiently cool to retain its form; the rod is then broken off, in the same manner as before, and the circle of glass is carried to the *annealing-furnace*,



where it is gradually cooled. The knot which is found in window-glass, shows the spot from which the iron was broken.

There is a kind of glass called German plate, (much thinner than the genuine plate-glass) which is made by blowing the metal. The annexed diagram will make this mode intelligible to the reader after the above detailed account, without much additional description. The metal is first blown into a long pear-like shape, fig. 9; one end of this is pierced with



an iron instrument, fig. 10, and the opening is afterwards enlarged by the same means, as at fig. 11. A slit is now made with a pair of shears through half its length, fig. 12, and the iron instrument seen at fig. 10, having been dipped in the melted metal, is applied to the open end. The iron rod is now broken off, and the opening enlarged to the same size as that at the opposite end; the form is now, as at fig. 13, a perfect cylinder, like a roll of paper. The slit is now continued the whole length, and being laid upon a smooth iron table, it falls flat like a sheet of paper, as at fig. 14.

The only glass-houses at present at work in London, are those in which the smaller kind of articles are made; as decanters, cruets, wine-glasses, and hundreds of other things. Various contrivances are made use of for the purpose of forming them into different shapes, but the material parts of the operations are much the same as those already mentioned. In some instances, brass moulds are employed, into which the different articles are blown, and in this manner many excellent imitations of cut-glass are formed.

The last and finest description of glass we have to notice, is *Plate-glass;* this, as already mentioned, is cast in the same manner as sheet-lead. The bed of the table on which the plate-glass is cast is made of copper, and after the melted glass has spread over the whole of its surface, a heavy polished roller, also of copper, is passed over its surface, reducing it in this manner to an equal thickness over its whole area. The operation of casting takes place close to the mouth of the annealing-furnace, into which it is carried immediately it becomes solid. As soon as the plate is withdrawn from the annealing-furnace, it has to undergo the process of polishing. To this end it is imbedded in plaster of Paris, on a table made of slate or marble; a smaller plate is then laid upon it, loaded with heavy weights; water and fine sand are constantly supplied, and the upper plate is moved about in every direction, until the surfaces of both are perfectly level. The last degree of polish is given to it by means of a rubber, formed of a block of wood, covered with black cloth and stuffed with wool.

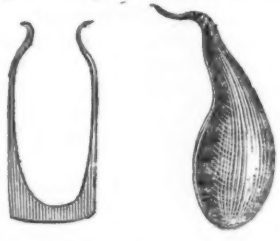
The various kinds of glass we have been speaking of, possess different properties, according to the purposes to which they are to be applied. Flint-glass, of which most ornamental articles are made, is rendered softer than the other sorts, and plate-glass, on the contrary, is made of as hard a texture as possible, to prevent its being easily scratched.

We have already spoken of the glass being placed in the *annealing-furnace*, which might more appropriately be called an *oven*, since a low red-heat is the highest degree to which it is ever heated. The

purpose for which the glass is placed in this furnace, is to allow it to cool gradually down to the temperature of the air, by first placing it in the hottest part of the oven, and afterwards gradually removing it to the mouth. For some of the larger pieces of plate-glass, this operation will occupy the space of two or three weeks. If glass is not properly annealed, the most trifling scratch or blow from a sharp body, or any sudden change from heat to cold, will cause it to break. If suddenly cooled in making, without undergoing the process of annealing, this brittle property is increased to an extreme degree

Two philosophical toys, one called the Bologna Phial, and the other, Prince Rupert's Drops, or commonly the *hand-cracker*, are good instances of this.

The Bologna phial, is merely a wide-mouthed bottle of unannealed green glass, extremely thin at the neck and upper half of its sides, and very thick below. A leaden bullet may be dropped into this bottle from the height of several feet without danger; but if a large grain of sand, or, what is better, a small piece of broken gun-flint, is allowed to fall into it through the space only of a few inches, the



shock produced will break the bottle to pieces. If laid on its side, the thick end may be struck with considerable force with a wooden mallet without danger; but it would be immediately broken, if merely scratched with a piece of sand.

The hand-cracker, which is found in every toy-shop, is a very familiar instance of this property: the thick end of this may be laid on the table, and struck forcibly with the fist without danger, but if it is grasped in the hand, and the smallest portion of the thin end is broken off, the whole of it breaks to pieces or bursts, with so much violence as to sting slightly the hand that holds it.

The purposes to which this beautiful material have been applied, are as numerous as they are useful; it has added materially to the comforts and conveniencies of private life; it has, among many other invaluable benefits, assisted the astronomer in his researches, and the microscopic philosopher in the detection of the more minute operations of Nature, among the lower classes of animals; and to it we are indebted for our chief discoveries in Electricity.

IN the morning, when you awake, accustom yourself to think first upon God, or something in order to his service; and at night also let him close thine eyes, and let your sleep be necessary and healthful, not idle and expensive of time beyond the needs and conveniencies of nature: and sometimes be curious to see the preparation which the sun makes when he is coming forth from his chambers of the east!—JEREMY TAYLOR.

WHEN the poet Carpani inquired of his friend Haydn, how it happened that his Church Music was always so cheerful, the great composer made a most beautiful reply. "I cannot," he said, "make it otherwise. I write according to the thoughts I feel, when I think upon God, my heart is so full of joy that the notes dance and leap, as it were, from my pen; and since God has given me a cheerful heart, it will be pardoned me that I serve him with a cheerful spirit." The reader who is acquainted with the works of Haydn will bear testimony to the practical truth of this anecdote.—*British Magazine.*

THE FIFTH DAY OF CREATION.

IT is beautiful to observe how the harmonies of nature illustrate the sublimely-simple account of the Creation given in the sacred volume; how they bear silent, but irresistible testimony to its truth; and stamp it with the authority of their common divine origin. In considering that record, we find that the same day witnessed, the same word commanded, the creation of fishes and birds. The words of the narrative are,—

> And God said, Let the waters bring forth abundantly the moving creature that hath life, and fowl that may fly above the earth in the open firmament of heaven. And God created great whales, and every living creature that moveth, which the waters brought forth abundantly, after their kind, and every winged fowl after his kind: and God saw that it was good. And God blessed them, saying, Be fruitful, and multiply, and fill the waters in the seas, and let fowl multiply in the earth. And the evening and the morning were the fifth day.——GENESIS i., 20 to 23.

Now it will naturally occur to the philosophic mind, to inquire, whether, and how far, these objects of a common creation exhibit community of character; and if the points of resemblance prove to be both numerous and striking, shall we not have turned science to its noblest end, when we make it display the unity of design in the works of the Creator?

A casual observer will, perhaps, smile at first, at the idea of tracing a likeness between fishes and birds; yet even he (if possessed of any reflection) will be struck by the generally wedge-like form of each, so peculiarly suited for enabling them to cleave their way through the yielding fluids in which they live and move. Having thus discovered a preliminary, though we will allow, rather a faint point of analogy, he may be induced to extend his remarks further; and, possibly, will next note the similarity in structure and uses of fins and wings; how, by their means, the tribes furnished with them are enabled to soar through the air or swim through the sea; how nearly the motions they give resemble; how in each species they occupy the place held by the upper extremity in the beasts of the earth; how the wing gradually degenerates from the strong pinion of the eagle, which raises it to heights almost beyond human ken, to the scantily-furnished appendages of the divers and penguins, which, unable to lift them above the level of the water, are serviceable in swimming beneath its surface; and, on the other hand, how the fin gradually improves, from the tiny membrane, that scarce serves to direct the body to which it is attached through the deep, up to the fully-formed and expanded fin of the flying-fish, which enables it to rise into the fields of air *et petere non sua regna.*

> A joyous creature vaulted through the air,
> The aspiring fish that fain would be a bird,
> On long light wings that flung a diamond shower
> Of dew-drops round its evanescent form,
> Sprang into light, and instantly descended.

The analogy may be further pursued. We observe the fins in the higher inhabitants of the water, as for instance, the seal and manatee, gradually approaching the form of superior extremities, furnished with claws, which, however rude and imperfect, still enable them to serve as organs of prehension and locomotion: while, in like manner, the bat, which forms as it were the connecting link between birds and animals of the earth, has its curious and extended wings furnished at the extremities with nails, enabling them to maintain a firm hold. We next consider the tail, which naturalists now agree is used by birds to assist them in rising or falling in their flight: in the whale-kind, the tail being horizontal, is exactly of the same use, and as these animals breathe by lungs (not, as fish gene-

rally, by gills), it is more important that such provision should exist for enabling them at pleasure to attain the surface, there to inhale the necessary supply of vital air. We may remark, by the way, that in other fishes the tail-fin is generally vertical, and is rather an instrument of progression than available to the purposes of elevation and depression.

Connected with this circumstance, occurs another beautiful point of similarity. Several fishes are furnished with a swimming-bladder, into which they appear to have the power of secreting air, the effect of which will be to render them specifically lighter than water, and thus promote their rising to the surface; while the expulsion of this air, and consequent diminution of bulk, again gives them the gravity necessary for descending. But in birds, who, living in a rarer medium, require more constant buoyancy, the lungs are connected with extensive air-cells, not only occupying parts of the chest and belly, but even extending to the hollow of the bones, the air in which, necessarily much rarefied by their high temperature, gives them such a degree of lightness, as to enable them with impunity to soar to elevations, far below which the rarity of the atmosphere renders even respiration painful and laborious to us. Nor will the naturalist be at a loss to find corresponding points in the habits and manners of these denizens of the air and of the wave. While the larger and more rapacious of each, the lordly eagle, the ravenous vulture, the rapacious shark, appear solitary and unsocial, the "smaller fry" herd together by a natural instinct, and seem to seek, in union and numbers, that strength and safety which, individually, they are denied. The ease, too, with which certain species of each bear all varieties of climate, deserves to be mentioned. Thus the rose-coloured blackbird appears spread through the hottest and coldest parts of the old continent. It has been seen on the burning sands of Arabia, and in the plains of Aleppo. Le Vaillant has met with it in Africa, as high as 24° south latitude. It has been sent into this country from Bengal. Pallas has found it in the north of Siberia, in the mountainous vicinity of the Irtish, where it nestles. Very numerous flocks of these birds traversed Provence and Piedmont, in the autumn of 1817. They are found in the mountains of Lapland, are common on the shores of the Caspian, near Astracan, and along the entire extent of the Volga, and they pass every year in large flocks into the southern part of Russia. But widely as they are extended, various as are the regions in which they are met, they are rivalled by the porpoise, which in every sea, "from Indus to the Pole," is seen "on the surge, tumbling in wild glee;" equally at home where the wave warms "beneath the near approaching sun," as where "stern winter holds perpetual sway." The migratory disposition, too, is equally shared by both these divisions of the animal kingdom. The periodical return of the herrings to our western coasts, or of the cod to the banks of Newfoundland, is looked to by many as their mode of gaining a sustenance and supporting life. With no less eagerness and confidence, do the United-States men expect the visits of the travelling pigeon, which, in search of food, traverses in immense flocks the whole Continent of North America, from Hudson's Bay to the Gulf of Mexico. In these migrations they fly at a great height, in columns of some miles in breadth, several strata deep, and continue to pass, sometimes, for three or four days in succession. During this time, Audubon says, "The air was literally filled with pigeons. The light of the noon-day was obscured as by an eclipse. The dung fell in spots as thick as flakes of snow; and the continued buz of wings had a tendency to lull the senses to repose."

There remain still more striking analogies in their oviparous generation, in the forms of their brain, in the structure of the organs of smell and hearing, in the admirable adaptation of the eye in each, to the differently-refracting media through which the light reaches them; but these would require more minute anatomical detail than could be introduced in a popular essay. Let it suffice to mention one more provision common to each, and we shall have done.

A bird compresses with its closing wings the air; this, by its elasticity, reacts on the body of the bird, and causes it to rise. For this purpose it is clearly necessary, that the wing should not be permeable to air, for, could the air escape between the feathers, there would be no compression, and consequently no reaction. To discover the manner in which this is prevented, let us take a quill, and gently separating two of the little lamina which compose the feather part, we shall observe them holding together by minute teeth or bristles, on their edges, which entwine themselves with corresponding projections on the adjacent lamina. Each of the lamina also is fluted on its upper side, and this rides, as it were, on the one above it. But, as in spite of all these precautions, accidents will occasion the separation of these lamina, Nature has provided all birds with a certain gland, which distils over their crupper an oily humour. When, therefore, they wish to restore their feathers to order, when they "turn to plume their ruffled wing," they fill their beaks with this oil, and passing their feathers individually through it, at the same time anoint their plumes and restore to order the disarranged lamina. Birds of passage are generally observed to do this carefully, previous to starting on their distant expeditions. In the aquatic fowls, this secretion is peculiarly abundant, so much so, as even to give a flavour to the flesh; being destined in them not only to perform the above office, but also to enable their glossy and well-oiled plumage to throw off the water, which, though they live amidst it, may be said, "not to come nigh them."

But to fishes, who live immersed in the briny wave, such a secretion is absolutely indispensable, to shield them from the inconveniences to which their situation would otherwise expose them, and to save them from the friction between the water and their scales, which otherwise would so materially have retarded their speed. And has a kind Providence overlooked their wants, or forgotten their necessities? No: that Being who marks the sparrow's fall, whose eye is over all his works, has extended his care to the "finny inhabitants of the deep." They too are furnished with this oily secretion; and seeing that by structure they are disabled from applying it, as birds do, to their own surface, the gland is, by a beautiful and wise provision, placed in the front of the body, so that the very waves, as they swim forward, carry back the secretion, and apply it over the whole apparatus of their fins and scales.

Here then we pause. We challenge scepticism itself to doubt the analogy we have drawn, to deny the facts we have stated. And what less than divine Wisdom could have inspired, than divine Omniscience could have dictated, an account of the mysteries of Creation, so perfect, so simple, so based in Nature's surest laws, that the accumulated scientific observations of thousands of years can but point out new harmonies in the narrative, or add its humble mite of testimony to the truth and certainty of the Holy Record.

P. B. L.

THE CANDLEBERRY MYRTLE.

(Myrica cerifera.)

THE shrub, a branch of which is represented in the engraving, is a native of the intertropical parts of America, and the curious and useful properties of its seeds render it a very remarkable vegetable production. It never attains a large size, seldom exceeding ten or twelve feet in height. Its blossoms appear about the middle of May, and then bear a great resemblance to the catkins, or male flowers, of the hazel-nut; the left-hand sprig of the branch in the engraving shows their arrangement.

FRUIT AND FLOWER OF THE CANDLEBERRY MYRTLE.

About the month of November or December, the seeds being then ripe, a number of the natives, each taking with him the whole of his family, repair to the sea-side, where these trees are found in abundance, for they appear to delight in a moist sandy soil. The berries, when they are ripe, have a great resemblance to bunches of small grapes, and form in clusters round the branches, as may be seen by the engraving.

Each family now builds a kind of temporary hut, covered with the leaves of different sorts of palms, and here they remain for a fortnight or three weeks. The men having cut down the trees, the women and children busy themselves in stripping the branches of the fruit, which they throw into large iron pots, half filled with water; it is then boiled as long as any of the waxy substance, which the seeds contain, continues to rise to the surface. As fast as this vegetable-tallow rises, it is skimmed off, and placed in brass vessels, where it is re-melted and clarified. Its appearance, when cold, very much resembles bees' wax, and its colour is a dirty green. When formed into candles, it is usually mixed with about one-fourth of its weight of tallow; this causes it to burn with a brighter flame. It gives a clear and steady light, and, while it is burning, produces an extremely pleasant smell.

Two manifestations of the course of Providence have often been pointed out as the most distinct and prominent which have yet occurred in the history of the human race. The coming of our Lord and Saviour is one, at that precise time when the world, in its moral and political circumstances, was best fitted for the reception and diffusion of the Gospel; the other, far indeed inferior in moment to that paramount event, but inferior to it alone, is the discovery of printing, just when the Gospel itself was to be raised as it were from the dead.—SOUTHEY.

ANNIVERSARIES IN OCTOBER.

MONDAY, 7th.

1748 The Peace of Aix-la-Chapelle signed.

TUESDAY, 8th.

1361 A singular combat took place in the Isle of Notre Dame, in the presence of the King and the Court of France, between the dog of a gentleman, who had been assassinated, and the supposed murderer; the dog was successful, and the accused acknowledged his guilt.

1744 The Victory, man-of-war, with Admiral Balchen and 1100 men on board, was wrecked on the coast of Alderney, when every soul on board perished.

1820 *Christophe*, the black King of Hayti, shot himself in his palace, fearing to fall into the hands of his enemies.

WEDNESDAY, 9th.

1759 Eddystone Light-house completed, under the superintendence of Mr. John Smeaton, a very celebrated engineer.

FRIDAY, 11th.

1531 *Zuinglius*, the zealous Swiss reformer, was killed in battle, near Cappel, in the Canton of Zug.

1737 A dreadful hurricane, attended by an earthquake, was felt near the mouths of the Ganges, the waters of which rose forty feet above their level, devastating the country, and destroying upwards of 300,000 souls. At Calcutta, the steeple of the English church was sunk in the ground without being broken.

1797 The Battle of Camperdown, in which Admiral Duncan defeated the Dutch fleet, taking or destroying fifteen sail of the line.

1811 The first stone of Waterloo Bridge, London, laid.

1814 The Electorate of Hanover erected into a kingdom.

SATURDAY, 12th.

538 B. C. Jerusalem taken by Nebuchadnezzar, which event put an end to the kingdom of Judah.

1492 Columbus landed on the Island of Guanahani now called St. Salvador, which was the first land discovered in the NEW WORLD.

1702 Sir George Rooke attacked the Spanish Galleons in the port of Vigo, and brought off captive several of these rich treasure-ships.

1768 The empress Catherine II. submitted to inoculation for the small-pox, with a view of inducing her subjects to do so by her example.

SUNDAY, 13th.

NINETEENTH SUNDAY AFTER TRINITY

THIS truth ought to be deeply printed in minds studious of wisdom and their own content, that they bear their happiness or unhappiness within their own breast; and that all outward things have a right and a wrong handle; he that takes them by the right handle finds them good, he that takes them by the wrong indiscreetly, finds them evil. Take a knife by the haft it will serve you, take it by the edge it will cut you. There is no good thing but is mingled with evil, there is no evil but some good enters into the composition. The same truth holds in all persons, actions, and events. Out of the worst, a well composed mind endowed with the grace of God may extract good, with no other chemistry than piety, wisdom, and serenity. It lieth in us as we incline our minds to be pleased or displeased with most things in the world. One that hath fed his eyes with the rich prospect of delicate countries, as Lombardy, Anjou, where all the beauties and dainties of nature are assembled, will another time take no less delight in a wild and rugged prospect of high bare mountains, and fifty stories of steep rocks, as about the Grande Chartreuse and the bottom of Ardennes, where the very horror contributes to the delectation. If I have been delighted to see the trees of my orchard, in the spring blossomed, in the summer shady, in autumn hung with fruit; I will delight again, after the fall of the leaf, to see through my trees new prospects which the bushy boughs hid before; and will be pleased with the sight of the snow candied about the branches, as the flowers of the season.—DU MOULIN.

THE philosopher carries with him into the world the temper of the cloister, and preserves the fear of doing evil, while he is impelled by the zeal of doing good. He is rich or poor, without pride in riches or discontent in poverty; he partakes of pleasure with temperance, and enjoys the distinctions of honour with moderation. He passes undefiled through a polluted world, and amidst all the vicissitudes of good and evil, has his heart fixed only where true joys are to be found.

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